



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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OFFICE OF CHEMICAL SAFETY AND POLLUTION PREVENTION

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MEMORANDUM

Subject: Addendum to 2,4-D Choline Salt Section 3 Risk Assessment: Designated Critical Habitat Modification Determinations for Proposed New Uses on Herbicide-Tolerant Corn and Soybean for AR, IL, IN, IA, KS, LA, MN, MS, MO, NE, ND, OH, OK, SD, TN, and WI

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The Environmental Fate and Effects Division (EFED) issued endangered species risk assessments for a Federal action involving proposed new uses of the 2,4-D choline salt on herbicide-tolerant corn and soybean. The assessments encompassed 16 states – AR, IA, IL, IN, KS, LA, MN, MO, MS, ND, NE, OH, OK, SD, TN, and WI – and made effects calls based on habitat information and species-specific biology (DP 418022, 421678, 422714). While habitat information was integral to these assessments, no explicit statements were made regarding principle constituent elements (PCE's) when critical habitat was designated for a listed species. This memo presents a critical habitat analysis for all listed species within the 16 states.

The critical habitat modification analysis is based on an assessment of how 2,4-D choline salt would affect the US Fish and Wildlife or National Marine Fisheries Service (the Services) established principle constituent elements (PCE's) of the designated habitat as well as how direct species effects outcomes would impact critical habitat's present and future utility for promoting the conservation of a particular listed species. The Agency concluded 'modification' of designated critical habitat if the range of designated critical habitat co-occurs with the states subject to the Federal action and one or more of the following conditions exist:

1. The available Services' information indicates that corn or soybean fields are habitat for the species and there is a "may affect" determination for the species associated with 2,4-D choline salt, as labeled.
2. The available Services' information indicates that the species uses corn or soybean fields and one or more effects on taxonomic groups predicted for 2,4-D choline salt on corn and soybean fields would modify one or more of the designated PCEs.

If the above conditions are not met, EPA concludes 'no modification.'

Results of Analysis

Of the 186 listed species within the 16 states there are 175 species identified in the effects determinations as not using corn and soybean fields and 11 species using these fields (Appendix A). Critical habitats have been designated for 59 of the 186 species. Fifty-two species with critical habitat were judged to not use corn or soybean fields and so the critical habitat determination for these was no modification. The remaining 7 species with critical habitat designations were assumed to use corn or soybean fields and so the previous listed species effects determinations were consulted to ascertain if any were determined to be at risk for direct adverse effects. None of the species were determined to be at risk for direct adverse effects, so the PCE's listed in the Services' critical habitat designations were consulted to determine if, in light of the screening assessment risk findings, they would be impacted by on-field exposure to 2,4-D choline salt. For all but one of these species, the PCE's are not relatable to agricultural fields and so a determination of no modification has been made for these 6 species.

The only species using corn and soybean fields and with critical habitat PCE's relatable to agricultural fields was the whooping crane, for which agricultural fields were discussed as providing waste grain as a potential food source for migratory cranes. The only way the proposed 2,4-D choline salt could affect this PCE is by making grain potentially toxic to the birds. The Health Effects Division (HED) summarized available corn and soybean grain residues of 2,4-D in the Human Health Risk Assessment for a Proposed Use of 2,4-D Choline on Herbicide-Tolerant Corn and Soybean (DP 389455). Based on HED's assessment, residues of 2,4-D on corn and soybean grain were non-detectable (<0.01 mg 2,4-D/kg). The measured residues are not reasonably expected to be at a level raising a concern for direct effects to the whooping crane because the past direct effects assessment for this species did not establish a concern for residues in other food items at much **higher** concentrations than the detection limit

reported for grain in the HED summary. Therefore whooping crane critical habitat within the 16 states would not be modified.

Summary of Determinations for Critical Habitat

The Agency has determined that the proposed labeled use of 2,4-D choline salt on corn and soybeans will not modify designated critical habitat for the 59 species for which such habitats have been designated in AR, IL, IN, IA, KS, LA, MN, MS, MO, NE, ND, OH, OK, SD, TN, and WI.

Appendix A

Critical Habitat Designations and PCE Descriptions

Summary of listed species identified as being off agricultural fields with and without critical habitat designations for the first 16 states assessed for 2,4-D choline salt

Critical Habitat Designation	Species Name
<i>Species with Critical Habitat Designations (52 Species)¹</i>	Bean, Purple (<i>Villosa perpurpurea</i>)
	Butterfly Plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)
	Butterfly, Karner Blue (<i>Lycaeides melissa samuelis</i>)
	Cavesnail, Tumbling Creek (<i>Antrobia culveri</i>)
	Chub, Slender (<i>Erimystax cahni</i>)
	Chub, Spotfin (<i>Erimonax monachus</i>)
	Clubshell, Ovate (<i>Pleurobema perovatum</i>)
	Clubshell, Southern (<i>Pleurobema decisum</i>)
	Combshell, Cumberlandian (<i>Epioblasma brevidens</i>)
	Combshell, Upland (<i>Epioblasma metastriata</i>)
	Dace, Laurel (<i>Chrosomus saylori</i>)
	Darter, Amber (<i>Percina antesella</i>)
	Darter, Cumberland (<i>Etheostoma susanae</i>)
	Darter, Leopard (<i>Percina pantherina</i>)
	Darter, Niangua (<i>Etheostoma nianguae</i>)
	Darter, Slackwater (<i>Etheostoma boschungii</i>)
	Darter, Snail (<i>Percina tanasi</i>)
	Darter, Yellowcheek (<i>Etheostoma moorei</i>)
	Dragonfly, Hine's Emerald (<i>Somatochlora hineana</i>)
	Elktoe, Appalachian (<i>Alasmidonta raveneliana</i>)
	Elktoe, Cumberland (<i>Alasmidonta atropurpurea</i>)
	Frog, Dusky Gopher (<i>Rana sevosa</i>)
	Kidneyshell, Fluted (<i>Ptychobranhus subtentum</i>)
	Kidneyshell, Triangular (<i>Ptychobranhus greenii</i>)
	Logperch, Conasauga (<i>Percina jenkinsi</i>)
	Madtom, Chucky (<i>Noturus crypticus</i>)
	Madtom, Smoky (<i>Noturus baileyi</i>)
	Madtom, Yellowfin (<i>Noturus flavipinnis</i>)
	Manatee, West Indian (<i>Trichechus manatus</i>)
	Moccasinshell, Alabama (<i>Medionidus acutissimus</i>)
	Moccasinshell, Coosa (<i>Medionidus parvulus</i>)
	Mucket, Neosho (<i>Lampsilis rafinesqueana</i>)
	Mucket, Orangenacre (<i>Lampsilis perovalis</i>)
	Mussel, Oyster (<i>Epioblasma capsaeformis</i>)
	Pearl mussel, Slabside (<i>Pleuronaia dolabelloides</i>)
	Pigtoe, Georgia (<i>Pleurobema hanleyianum</i>)
	Pigtoe, Southern (<i>Pleurobema georgianum</i>)
	Plover, Piping (Great Lakes DPS, Northern Great Plains DPS) (<i>Charadrius melodus</i>)
	Rabbitsfoot (<i>Quadrula cylindrica cylindrica</i>)
	Rabbitsfoot, Rough (<i>Quadrula cylindrica strigillata</i>)

¹ Critical habitat designation status determined using U.S. Fish & Wildlife Service's Environmental Conservation Online System (ECOS) species profiles.

Species without Critical Habitat Designations (123 species)	Rock-Cress, Braun's (<i>Arabis perstellata</i>)
	Sculpin, Grotto (<i>Cottus sp.</i>)
	Sea Turtle, Green (<i>Chelonia mydas</i>)
	Sea Turtle, Hawksbill (<i>Eretmochelys imbricata</i>)
	Sea Turtle, Kemp's Ridley (<i>Lepidochelys kempii</i>)
	Sea Turtle, Leatherback (<i>Dermochelys coriacea</i>)
	Sea Turtle, Loggerhead Northwest Atlantic DPS (<i>Caretta caretta</i>)
	Shiner, Arkansas River (<i>Notropis girardi</i>)
	Shiner, Topeka (<i>Notropis topeka</i> (=tristis))
	Spruce-Fir Moss, Spider (<i>Microhexura montivaga</i>)
	Sturgeon, Gulf (<i>Acipenser oxyrinchus desotoi</i>)
	Tiger Beetle, Salt Creek (<i>Cicindela nevadica lincolniiana</i>)
	Acornshell, Southern (<i>Epioblasma othcaloogensis</i>)
	Amphipod, Illinois Cave (<i>Gammarus acherondytes</i>)
	Aster, Decurrent False (<i>Boltonia decurrens</i>)
	Aster, Ruth's Golden (<i>Pityopsis ruthii</i>)
	Avens, Spreading (<i>Geum radiatum</i>)
	Bat, Gray (<i>Myotis grisescens</i>)
	Bean, Cumberland (pearlymussel) (<i>Villosa trabalis</i>)
	Black-footed Ferret (<i>Mustela nigripes</i>)
	Bladderpod, Missouri (<i>Physaria filiformis</i>)
	Blossom, Green (pearlymussel) (<i>Epioblasma torulosa gubernaculum</i>)
	Blossom, Tubercled (pearlymussel) (<i>Epioblasma torulosa torulosa</i>)
	Blossom, Turgid (pearlymussel) (<i>Epioblasma turgidula</i>)
	Blossom, Yellow (pearlymussel) (<i>Epioblasma florentina florentina</i>)
	Bluet, Roan Mountain (<i>Hedyotis purpurea</i> var. <i>montana</i>)
	Bush-Clover, Prairie (<i>Lespedeza leptostachya</i>)
	Butterfly, Mitchell's Satyr (<i>Neonympha mitchellii mitchellii</i>)
	Catspaw , White (<i>Epioblasma obliquata perobliqua</i>)
	Cavefish, Ozark (<i>Amblyopsis rosae</i>)
	Chaffseed, American (<i>Schwalbea americana</i>)
	Clover, Running Buffalo (<i>Trifolium stoloniferum</i>)
	Clubshell (<i>Pleurobema clava</i>)
	Clubshell, Black (<i>Pleurobema curtum</i>)
	Combshell, Southern (<i>Epioblasma penita</i>)
	Crayfish, Cave (<i>Cambarus aculabrum</i>)
	Crayfish, Cave (<i>Cambarus zophonastes</i>)
	Crayfish, Nashville (<i>Orconectes shoupi</i>)
	Dace, Blackside (<i>Phoxinus cumberlandensis</i>)
	Daisy, Lakeside (<i>Hymenoxys acaulis</i> var. <i>glabra</i> (herbacea))
	Darter, Bayou (<i>Etheostoma rubrum</i>)
	Darter, Bluemask (=jewel) (<i>Etheostoma sp.</i>)
	Darter, Boulder (<i>Etheostoma wapiti</i>)
	Darter, Duskytail (<i>Etheostoma percnurum</i>)
	Decurrent False Aster (<i>Boltonia decurrens</i>)
	Disc, Iowa Pleistocene (<i>Discus macclintocki</i>)
	Fanshell (<i>Cyprogenia stegaria</i>)
	Fatmucket, Arkansas (<i>Lampsilis powellii</i>)
	Fern, American Hart's-Tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)
	Ferret, Black-Footed (<i>Mustela nigripes</i>)
	<i>Geocarpon minimum</i> (No common name)
	Goldenrod, Blue Ridge (<i>Solidago spithamea</i>)

Goldenrod, Short's (<i>Solidago shortii</i>)
Grass, Tennessee Yellow-Eyed (<i>Xyris tennesseensis</i>)
Ground-Plum, Guthrie's (=Pyne's) (<i>Astragalus bibullatus</i>)
Harperella (<i>Ptilimnium nodosum</i>)
Heelsplitter, Alabama (=inflated) (<i>Potamilus inflatus</i>)
Hellbender, Ozark (<i>Cryptobranchus alleganiensis bishopi</i>)
Higgins Eye Pearlymussel (<i>Lampsilis higginsii</i>)
Iris, Dwarf Lake (<i>Iris lacustris</i>)
Lampmussel, Alabama (<i>Lampsilis virescens</i>)
Lichen, Rock Gnome (<i>Gymnoderma lineare</i>)
Lilliput, Pale (pearlymussel) (<i>Toxolasma cylindrellus</i>)
Lily, Minnesota Dwarf Trout (<i>Erythronium propullans</i>)
Locoweed, Fassett's (<i>Oxytropis campestris</i> var. <i>chartacea</i>)
Madtom, Neosho (<i>Noturus placidus</i>)
Madtom, Pygmy (<i>Noturus stanauli</i>)
Madtom, Scioto (<i>Noturus trautmani</i>)
Marstonia, Royal (snail) (<i>Pyrgulopsis ogmorhapha</i>)
Milkweed, Mead's (<i>Asclepias meadii</i>)
Monkeyface, Appalachian (pearlymussel) (<i>Quadrula sparsa</i>)
Monkeyface, Cumberland (pearlymussel) (<i>Quadrula intermedia</i>)
Monkshood, Northern Wild (<i>Aconitum novoboarense</i>)
Mucket, Pink (pearlymussel) (<i>Lampsilis abrupta</i>)
Mussel, Mapleleaf Winged (<i>Quadrula fragosa</i>)
Mussel, Scaleshell (<i>Leptodea leptodon</i>)
Mussel, Sheepnose (<i>Plethobasus cyphus</i>)
Mussel, Snuffbox (<i>Epioblasma triquetra</i>)
Orchid, Western Prairie White-fringed (<i>Platanthera praeclara</i>)
Orchid, Eastern Prairie White-fringed (<i>Platanthera leucophaea</i>)
Pearlshell, Louisiana (<i>Margaritifera hembeli</i>)
Pearlymussel, Birdwing (<i>Lemiox rimosus</i>)
Pearlymussel, Cracking (<i>Hemistena lata</i>)
Pearlymussel, Curtis (<i>Epioblasma florentina curtisii</i>)
Pearlymussel, Dromedary (<i>Dromus dromas</i>)
Pearlymussel, Fat Pocketbook (<i>Potamilus capax</i>)
Pearlymussel, Littlewing (<i>Pegias fabula</i>)
Penstemon, Blowout (<i>Penstemon haydenii</i>)
Pigtoe, Cumberland (<i>Pleurobema gibberum</i>)
Pigtoe, Finerayed (<i>Fusconaia cuneolus</i>)
Pigtoe, Flat (<i>Pleurobema marshalli</i>)
Pigtoe, Rough (<i>Pleurobema plenum</i>)
Pigtoe, Shiny (<i>Fusconaia cor</i>)
Pimpleback, Orangefoot (<i>Plethobasus cooperianus</i>)
Pitcher-Plant, Green (<i>Sarracenia oreophila</i>)
Pocketbook, Fat (<i>Potamilus capax</i>)
Pocketbook, Ouachita Rock (<i>Arkansia wheeleri</i>)
Pocketbook, Speckled (<i>Lampsilis streckeri</i>)
Pogonia, Small Whorled (<i>Isotria medeoloides</i>)
Pondberry (<i>Lindera melissifolia</i>)
Potato-Bean, Price's (<i>Apios priceana</i>)
Prairie Bushclover (<i>Lespedeza leptostachya</i>)
Prairie-Clover, Leafy (<i>Dalea foliosa</i>)
Purple Cat's Paw (<i>Epioblasma obliquata obliquata</i>)
Quillwort, Louisiana (<i>Isoetes louisianensis</i>)

	Rayed Bean (<i>Vilosa fabalis</i>)
	Riffleshell, Northern (<i>Epioblasma torulosa rangiana</i>)
	Riffleshell, Tan (<i>Epioblasma florentina walkeri</i> (= <i>E. walkeri</i>))
	Ring Pink (mussel) (<i>Obovaria retusa</i>)
	Riversnail, Anthony's (<i>Athearnia anthonyi</i>)
	Rosemary, Cumberland (<i>Conradina verticillata</i>)
	Roseroot, Leedy's (<i>Rhodiola integrifolia</i> ssp. <i>leedyi</i>)
	Sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)
	Sawfish, Smalltooth (<i>Pristis pectinata</i>)
	Shiner, Blue (<i>Cyprinella caerulea</i>)
	Skullcap, Large-Flowered (<i>Scutellaria montana</i>)
	Snail, Painted Snake Coiled Forest (<i>Anguispira picta</i>)
	Sneezeweed, Virginia (<i>Helenium virginicum</i>)
	Spectaclecase Mussel (<i>Cumberlandia monodonta</i>)
	Spiraea, Virginia (<i>Spiraea virginiana</i>)
	Squirrel, Carolina Northern Flying (<i>Glaucomys sabrinus coloratus</i>)
	Stirrupshell (<i>Quadrula stapes</i>)
	Sturgeon, Pallid (<i>Scaphirhynchus albus</i>)
	Tern, Least (<i>Sterna antillarum</i>)
	Thistle, Pitcher's (<i>Cirsium pitcheri</i>)
	Turtle, Ringed Map (<i>Graptemys oculifera</i>)
	Turtle, Yellow-Blotched Map (<i>Graptemys flavimaculata</i>)
	Ute, Ladies'-Tresses, (<i>Spiranthes diluvialis</i>)
	Vireo, Black-Capped (<i>Vireo atricapilla</i>)
	Warbler, Kirtland's (<i>Dendroica kirtlandii</i>)
	Wartyback, White (pearlymussel) (<i>Plethobasus cicatricosus</i>)
	Watersnake, Northern Copperbelly (<i>Nerodia erythrogaster neglecta</i>)
	Whale, Finback (<i>Balaenoptera physalus</i>)
	Whale, Humpback (<i>Megaptera novaeangliae</i>)
	Woodpecker, Red-Cockaded (<i>Picoides borealis</i>)

Summary of listed species identified as being on agricultural fields with and without critical habitat designations for the first 16 states assessed for 2,4-D

Species Name	Primary Constituent Elements (PCE)	Source
<i>Species with Critical Habitat Designations (7 Species)²</i>		
Bat, Indiana (<i>Myotis sodalis</i>)	PCE: Shelter during winter hibernation. Critical habitat designations are either mines or caves.	http://ecos.fws.gov/docs/federal_register/fr161.pdf http://ecos.fws.gov/docs/federal_register/fr83.pdf
Bat, Ozark (<i>Corynorhinus townsendii ingens</i>)	PCE: Not specified. Critical habitat designations are caves.	http://ecos.fws.gov/docs/federal_register/fr171.pdf
Bear, Louisiana Black (<i>Ursus americanus luteolus</i>)	PCE: Habitat components that provide: (i) Breeding habitat (i.e., within or contiguous to the home range of females in a core breeding population) consisting of hardwood forest areas having a diversity of age class and species and containing sources of hard mast (acorns and nuts) produced by such species as mature oaks, hickories, and pecan, and that may include one or more of the	http://www.gpo.gov/fdsys/pkg/FR-2009-03-10/pdf/E9-4536.pdf#page=1

² Critical habitat designation status determined using U.S. Fish & Wildlife Service's Environmental Conservation Online System (ECOS) species profiles.

	<p>following:</p> <p>(A) Areas containing soft mast provided by a diversity of plant species, including, but not limited to, blackberry, grape, mulberry, sassafras, paw paw, etc., occurring primarily in forest openings, on spoil banks, and in areas adjacent to forested habitat.</p> <p>(B) Areas within forested habitat providing protein sources consisting of beetles and other colonial insects found in rotting and decaying wood found on the forest floor.</p> <p>(C) Grasses and sedges found in forest openings, on spoil banks with open canopies, and in vegetated areas adjacent to forested habitats.</p> <p>(D) Secure areas for reproduction, winter dormancy, day bedding, and escape. These include areas with den trees (e.g., bald cypress, overcup oak, American sycamore, etc.); areas with a thick understory, shrub-scrub habitat, openings along spoil banks, vegetated areas adjacent to forests, or any vegetation that provides cover, limits visibility, slows foot travel, or creates noise when traversed; early successional forests (0 to 12 years) with an open canopy and dense understory of shrubs, vines, and saplings; or areas with vegetation such as palmetto, greenbriars, blackberry, dewberry, and downed trees.</p> <p>(ii) Corridors consisting of:</p> <p>(A) Habitat patches 12 acres (5 hectares) or greater in size; or</p> <p>(B) Forested areas greater than 150 feet (46 meters) wide along waterways and sloughs and having a diversity of plant species and age-classes of sufficient area, quality, and configuration, as described in paragraph (2)(i) of this entry, to provide dispersal habitat between breeding populations to maintain genetic variability and promote stable or increasing populations, and to provide habitat supporting safe movement, foraging, and denning.</p>	
Crane, Mississippi Sandhill (<i>Grus canadensis pulla</i>)	PCE: Not specified.	http://ecos.fws.gov/docs/federal_register/fr150.pdf
Crane, Whooping (<i>Grus Americana</i>)	PCE: All areas proposed in this rule would provide food, water, and other nutritional or physiological needs of the whooping crane during spring or fall migration. (1) Insects, crayfish, frogs, small fish, and other small animals as well as some aquatic vegetation and some cereal crops in adjacent croplands appear to be major items taken during the migration period. Consumption of some cereal crops in adjacent croplands during migration period. (2) Require an open expanse for nightly rooting, especially sand and gravel bars or very shallow water in rivers and lakes. (3) Whooping cranes are territorial and require several acres of undisturbed wetlands. (4) Potential nesting habitat.	http://ecos.fws.gov/docs/federal_register/fr237.pdf http://ecos.fws.gov/docs/federal_register/fr214.pdf
Lynx, Canada (<i>Lynx canadensis</i>)	PCE: Boreal forest landscapes with large populations of snowshoe hares. Distribution and abundance of prey and microclimate influence movement, hunting behavior, and den and resting site locations. Areas with dense cover.	http://www.gpo.gov/fdsys/pkg/FR-2014-09-12/pdf/2014-21013.pdf
Wolf, Gray	PCE: Not specified.	http://ecos.fws.gov/docs/f

(<i>Canis lupis</i>)		ederal_register/fr186.pdf
<i>Species without critical habitat designations (4 species)</i>		
Beetle, American burying (<i>Nicrophorus americanus</i>)	No critical habitat rules have been published.	n/a
Bladderpod, Spring Creek (<i>Lesquerella perforata</i>) ³	No critical habitat rules have been published.	n/a
Prairie-chicken, Lesser (<i>Tympanuchus pallidicinctus</i>)	No critical habitat rules have been published.	n/a
Tortoise, Gopher (<i>Gopherus polyphemus</i>)	No critical habitat rules have been published.	n/a

³ Bold text indicates assessed species with “may effect, likely to adversely affect” determination.